AMENDMENTS TO THE CLAIMS

Claims 1-7. (Canceled)

8. (Currently Amended) A [[The]] metal chalcogenide composite nano-particle ~~according to claim 7,~~ comprising a metal capable of forming p-type semiconducting chalcogenide nano-particles and a metal capable of forming n-type semiconducting chalcogenide nano-particles, wherein at least one of said metal chalcogenides has a band-gap between 1.0 and 2.9 eV and the concentration of said metal capable of forming p-type semiconducting chalcogenide nano-particles is at least 5 atomic percent of said metal and is less than 50 atomic percent of said metal, wherein said metal capable of forming n-type semiconducting chalcogenide nano-particles is selected from the group consisting of zinc, bismuth, indium, tin, tantalum and titanium, and wherein said metal chalcogenide composite particle further comprises a [[said]] metal capable of forming spectrally sensitizing chalcogenide nano-particles with a band-gap between 1.0 and 2.9 eV is selected from the group consisting of silver, lead, copper, bismuth, vanadium and cadmium.

9. (Previously Presented) A metal chalcogenide composite nano-particle comprising a metal capable of forming p-type semiconducting chalcogenide nano-particles and a metal capable of forming n-type semiconducting chalcogenide nano-particles, wherein at least one of said metal chalcogenides has a band-gap between 1.0 and 2.9 eV and the concentration of said metal capable of forming p-type semiconducting chalcogenide nano-particles is at least 5 atomic percent of said metal and is less than 50 atomic percent of said metal, and wherein a stoichiometric deficit of the chalcogenide in said metal chalcogenide composite nano-particle is present.

10. (Withdrawn) A dispersion comprising a metal chalcogenide composite nano-particle comprising a metal capable of forming p-type semiconducting chalcogenide nano-particles and a metal capable of forming n-type semiconducting chalcogenide nano-particles, wherein at least one of said metal chalcogenides has a band-gap between 1.0 and 2.9 eV and the concentration of said metal capable of forming p-type semiconducting chalcogenide nano-particles is at least 5 atomic percent of said metal and is less than 50 atomic percent of said metal.

11. (Withdrawn) A process for preparing a dispersion comprising a metal chalcogenide composite nano-particle comprising a metal capable of forming p-type semiconducting chalcogenide nano-particles and a metal capable of forming n-type semiconducting chalcogenide nano-particles, wherein at least one of said metal chalcogenides has a band-gap between 1.0 and 2.9 eV and the concentration of said metal capable of forming p-type semiconducting chalcogenide nano-particles is at least 5 atomic percent of said metal and is less than 50 atomic percent of said metal, comprising the steps of preparing a composite metal chalcogenide nano-particle containing an .n-type semiconducting chalcogenide and a p-type semiconducting p-type semiconducting chalcogenide, wherein at least one of said metal chalcogenides has a band-gap between 1.0 and 2.9 eV.

12. (Withdrawn) The process according to claim 11, wherein said process further includes a coprecipitation step, a metal ion conversion step and/or a sintering step.

13. (Withdrawn) The process according to claim 11, wherein said coprecipitation is carried out in a medium containing at least one compound selected from the group consisting of thiols, triazole compounds and diazole compounds.

14. (Withdrawn) The process according to claim 11, wherein said process includes the step of mixing said metal chalcogenide composite nano-particles with spectrally sensitizing chalcogenide nano-particles with a band-gap between 1.0 and 2.9 eV.

15. (Withdrawn) The process according to claim 11, wherein said process comprises the step of converting said metal chalcogenide composite nano-particles with metal ions.

16. (Withdrawn) The process according to claim 11, wherein said process further comprises a diafiltration process step.

17. (Withdrawn) The process according to claim 16, wherein the washing medium in said diafiltration process comprises a phosphoric acid or a phosphoric acid salt.

18. (Withdrawn) A layer comprising metal chalcogenide composite nano-particles comprising a metal capable of forming p-type semiconducting chalcogenide nano-particles and a metal capable of forming n-type semiconducting chalcogenide nano-particles,

wherein at least one of said metal chalcogenides has a band-gap between 1.0 and 2.9 eV and the concentration of said metal capable of forming p-type semiconducting chalcogenide nano-particles is at least 5 atomic percent of said metal and is less than 50 atomic percent of said metal.

19. (Withdrawn) The layer according to claim 18, wherein said layer further contains at least one spectral sensitizer for said metal chalcogenide composite nano-particles.

20. (Withdrawn) The layer according to claim 19, wherein said at least one spectral sensitizer is selected from the group consisting of metal chalcogenide nano-particles with a band-gap between 1.0 and 2.9 eV, organic dyes, and metallo-organic dyes.

21. (Withdrawn) The layer according to claim 18, wherein said layer further comprises a binder.

22. (Withdrawn) The layer according to claim 21, wherein said binder is poly(vinyl pyrrolidone).

23. (Withdrawn) A photovoltaic device comprising a layer comprising metal chalcogenide composite nano-particles comprising a metal capable of forming p-type semiconducting chalcogenide nano-particles and a metal capable of forming n-type semiconducting chalcogenide nano-particles, wherein at least one of said metal chalcogenides has a band-gap between 1.0 and 2.9 eV and the concentration of said metal capable of forming p-type semiconducting chalcogenide nano-particles is at least 5 atomic percent of said metal and is less than 50 atomic percent of said metal.

24. (Withdrawn) A process for using a metal chalcogenide composite nano-particle comprising a metal capable of forming p-type semiconducting chalcogenide nano-particles and a metal capable of forming n-type semiconducting chalcogenide nano-particles, wherein at least one of said metal chalcogenides has a band-gap between 1.0 and 2.9 eV and the concentration of said metal capable of forming p-type semiconducting chalcogenide nano-particles is at least 5 atomic percent of said metal and is less than 50 atomic percent of said metal, and wherein said metal chalcogenide composite nano-particle is a component in a photovoltaic device.

25. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 9, wherein said metal chalcogenide composite nano-particle comprises a p-type semiconducting metal chalcogenide phase and a n-type semiconducting chalcogenide phase, and wherein the concentration of said p-type semiconducting metal chalcogenide in said metal chalcogenide composite nano-particle is at least 5 mole percent and is less than 50 mole percent.

26. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 9, wherein said metal chalcogenide composite particle is a coprecipitated particle.

27. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 9, wherein said metal chalcogenide composite particle is a metal sulphide composite particle.

28. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 9, wherein said metal capable of forming n-type semiconducting chalcogenide nano-particles is selected from the group consisting of zinc, bismuth, cadmium, mercury, indium, tin, tantalum and titanium.

29. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 9, wherein said metal capable of forming p-type semiconducting chalcogenide nano-particles is selected from the group consisting of copper, chromium, iron, lead and nickel.

30. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 9, wherein said metal chalcogenide composite particle further comprises a metal capable of forming spectrally sensitizing chalcogenide nano-particles with a band-gap between 1.0 and 2.9 eV.

31. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 30, wherein said metal capable of forming spectrally sensitizing chalcogenide nano-particles is selected from the group consisting of silver, lead, copper, bismuth, vanadium and cadmium.

32. (Previously Presented) A metal chalcogenide composite nano-particle comprising a metal capable of forming p-type semiconducting chalcogenide nano-particles and a metal capable of forming n-type semiconducting chalcogenide nano-particles, wherein at least one of said metal chalcogenides has a band-gap between 1.0 and 2.9 eV and the concentration of said metal capable of forming p-type semiconducting chalcogenide nano-particles is at least 5 atomic percent of said metal and is less than 50 atomic percent of said metal, and wherein said metal capable of forming p-type semiconducting chalcogenide nano-particles is selected from the group consisting of copper, chromium, iron and nickel.

33. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 32, wherein said metal chalcogenide composite nano-particle comprises a p-type semiconducting metal chalcogenide phase and a n-type semiconducting chalcogenide phase, and wherein the concentration of said p-type semiconducting metal chalcogenide in said metal chalcogenide composite nano-particle is at least 5 mole percent and is less than 50 mole percent.

34. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 32, wherein said metal chalcogenide composite particle is a coprecipitated particle.

35. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 32, wherein said metal chalcogenide composite particle is a metal sulphide composite particle.

36. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 32, wherein said metal capable of forming n-type semiconducting chalcogenide nano-particles is selected from the group consisting of zinc, bismuth, cadmium, mercury, indium, tin, tantalum and titanium.

37. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 32, wherein said metal chalcogenide composite particle further comprises a metal capable of forming spectrally sensitizing chalcogenide nano-particles with a band-gap between 1.0 and 2.9 eV.

38. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 37, wherein said metal capable of forming spectrally sensitizing chalcogenide nano-particles is selected from the group consisting of silver, lead, copper, bismuth, vanadium and cadmium.

39. (Currently Amended) A [[The]] metal chalcogenide composite nano-particle ~~according to claim 6, wherein~~ comprising a metal capable of forming p-type semiconducting chalcogenide nano-particles and a metal capable of forming n-type semiconducting chalcogenide nano-particles, wherein at least one of said metal chalcogenides has a band-gap between 1.0 and 2.9 eV and the concentration of said metal capable of forming p-type semiconducting chalcogenide nano-particles is at least 5 atomic percent of said metal and is less than 50 atomic percent of said metal, wherein said metal capable of forming n-type semiconducting chalcogenide nano-particles is selected from the group consisting of zinc, bismuth, indium, tin, tantalum and titanium, wherein said metal capable of forming p-type semiconducting chalcogenide nano-particles is selected from the group consisting of copper, chromium, iron, lead and nickel, wherein said metal chalcogenide composite particle further comprises a metal capable of forming spectrally sensitizing chalcogenide nano-particles with a band-gap between 1.0 and 2.9 eV, and wherein said metal capable of forming spectrally sensitizing chalcogenide nano-particles is selected from the group consisting of silver, lead, copper, bismuth, vanadium and cadmium.

40. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 28, wherein said metal capable of forming p-type semiconducting chalcogenide nano-particles is selected from the group consisting of copper, chromium, iron, lead and nickel.

41. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 36, wherein said metal chalcogenide composite particle further comprises a metal capable of forming spectrally sensitizing chalcogenide nano-particles with a band-gap between 1.0 and 2.9 eV, and wherein said metal capable of forming spectrally sensitizing chalcogenide nano-particles is selected from the group consisting of silver, lead, copper, bismuth, vanadium and cadmium.

42. (Previously Presented) The metal chalcogenide composite nano-particle according to claim 40, wherein said metal chalcogenide composite particle further comprises a metal capable of forming spectrally sensitizing chalcogenide nano-particles with a band-gap between 1.0 and 2.9 eV, and wherein said metal capable of forming spectrally sensitizing chalcogenide nano-particles is selected from the group consisting of silver, lead, copper, bismuth, vanadium and cadmium.

This listing of claims replaces all prior versions, and listings, of claims in the application.